

Expert Report of Arthur L. Frank, MD, PhD

INTRODUCTION

I have been engaged by the Law Firm of Speights & Runyan to provide expert testimony concerning the potential health effects of exposure to asbestos, including occupational, non-occupational and/or environmental exposure from in-place asbestos containing materials in buildings. Specifically, I have been asked for my opinions as to the potential occupational and non-occupational health hazards facing those who come in contact with, or disturb in-place asbestos containing materials and/or dust from such materials. As discussed in more detail in this report, I may offer medical testimony concerning the health effects of exposure to in-place asbestos containing materials in both occupational and non-occupational settings, applicable medical and scientific studies in literature, as well as issues related to public health policy. I may offer further testimony in response to additional matters or testimony of other experts of which I may learn more in the future.

QUALIFICATIONS

I am a duly licensed physician in the states of Pennsylvania and Texas practicing medicine in those states and I am currently Professor and Chairman of the Department of Environmental and Occupational Health at the Drexel University School of Public Health. I am Board Certified in Occupational Medicine, a branch of preventive medicine, and I am Board Certified in Internal Medicine.

I have been actively engaged in asbestos related matters in excess of thirty-five (35) years. My study of asbestos related matters began with my medical training at the Mount Sinai School of Medicine, where I studied with Dr. Irving J. Selikoff, who was an

internationally recognized expert on the subject of asbestos. In addition to extensive clinical activities, my original research for my PhD degree in Biomedical Science was on the subject of asbestos, especially dealing with its action on respiratory tissue. I have continued to be interested in this subject and I maintain ongoing professional activity in the field of asbestos related disease. I have served as an invited speaker on the subject of asbestos at many national and international meetings.

In addition, I have written extensively on the subject of asbestos disease. My doctoral thesis at the City University of New York was on the biological effects of asbestos. I have studied, worked and published extensively regarding the effects on humans of asbestos exposure in occupational and non-occupational settings. A copy of my current curriculum vitae and list of certifications, academic appointments, administrative appointments, fellowships and memberships in professional organizations, teaching activities, consultancies in related activities, books, reviews, and chapters in books, and published articles are attached hereto as Exhibit A.

Opinions

As a physician, researcher, investigator and public health physician, I have personally been involved in studies and research relating to the health effects of asbestos exposure to humans in occupational and non-occupational settings. Throughout my career I have also read hundreds of published articles and abstracts relating to the health effects of asbestos, including epidemiological studies, and have developed the following opinions, which I am prepared to express under oath to a reasonable degree of medical certainty:

1. It is my professional opinion, based upon my own work and the work of many others in the scientific community, that all types of asbestos are capable of causing cancerous and non-cancerous diseases in humans in both occupational and non-occupational settings. Even though different types of asbestos have different structures and chemical structures, all types of asbestos, including chrysotile and tremolite asbestos contained in W. R. Grace & Co.'s Monokote fireproofing product and acoustical plaster products, are known to cause both malignant and non-malignant diseases in humans or animals.

2. It is my opinion, and a well documented scientific and epidemiological fact, that the health hazards associated with exposure to asbestos include the development of parenchymal and pleural asbestosis and an increased hazard of developing several forms of cancer, including lung cancer, pleural and peritoneal mesothelioma, gastrointestinal tract cancers, including stomach and colon cancers, and laryngeal and kidney cancers.

The routes of exposure causing concern are especially by inhalation or ingestion. Most asbestos fibers that are taken into the body are by these routes and are not visible to the eye, or even to an optical microscope, and can only be seen by an electron microscope.

3. It is my professional opinion, based upon my own work and the work of many others in the scientific community that all fiber sizes can contribute to both malignant and non-malignant asbestos disease in humans, both occupationally and non-occupationally.

4. It is my professional opinion that the matter of health hazards from asbestos and amounts of exposure is one that is similar to other carcinogens. Although asbestos is a naturally-occurring mineral and can be found in ambient air and additional significant amounts have been added to the air related to human use, there is no level of asbestos exposure that is recognized as safe. Carcinogens such as asbestos are recognized as having no safe level to protect the largest number of people. There has been no threshold level established for asbestos for which it can be said with scientific certainty that it is safe and below which there is no potential of disease. Any amount of asbestos exposure carries with it hazards above that of having no asbestos present, although the accurate measure of that hazard may be difficult at low levels. However, the less asbestos present, the less the overall hazard.

Any excess exposure to asbestos over ambient air levels carries with it excess hazards to both humans and laboratory animals, and extremely short exposures, on the order of a day to a week, have been associated with an excess hazard of developing cancer. Each bit of excess exposure carries with it additional hazards.

I am familiar with the terms "threshold limit values" and "permissible exposure levels." These terms have been used by professional organizations and regulatory programs to describe various levels of asbestos exposure. It is my opinion that these levels do not represent a safe level of asbestos exposure. I agree with OSHA's assessment that the OSHA Permissible Exposure Limit ("PEL") represents the lowest feasible limit and that significant hazards exist below the PEL. Worldwide reports and occurrences of asbestos-related disease attributed to non-occupational asbestos exposures

underscores the lack of an identifiable exposure threshold for asbestos below which there is no hazard.

5. It is my opinion that because there is no scientifically reliable threshold of exposure below which there is no hazard, it is a scientifically acceptable technique for predicting the hazards of low-level asbestos exposures to extrapolate downward from studies involving higher-level exposures. To that end, data on occupational exposures to asbestos-containing materials and the resulting incidence of disease are relevant and helpful in determining the hazard to humans who may be exposed to lower-levels of asbestos.

6. It is my professional opinion that the decision as to when asbestos should be removed from a public or private building is a complex one, based upon a number of factors. Federal regulations of the Environmental Protection Agency currently in place require the careful and controlled removal of all asbestos-containing materials prior to major renovations in areas with friable asbestos-containing materials or prior to the demolition of a building. These regulations do not require air testing prior to removal, but clearly recognize the health hazards from exposures to friable asbestos-containing materials during renovation and demolition activities.

It is my professional opinion that these federal regulations that require removal prior to major renovations or demolition constitute sound public health policy, and are designed to prevent or minimize exposures to asbestos and asbestos-containing products in both occupational and non-occupational settings. The need for these regulations are supported by numerous epidemiological studies, data and literature generated which establish the prevalence of asbestos-related disease in workers and by-standers in

shipyards where asbestos-containing insulation was put in and removed from ships, as well as other settings.

7. It is my professional opinion that while air testing is one component used on the overall assessment of asbestos hazards, it is of limited use. Standard air testing methods require only light microscopic analysis of fibers, which is a crude measure of asbestos fibers present in the air. Additional testing with an electron microscope is a far superior, but vastly more expensive method of air testing, but even electron microscopic analysis of air samples has its drawbacks.

If only air testing is used for the assessment of asbestos present in the environment, then both light and electron microscopic analysis techniques are insufficient to make a full and reasoned assessment of the potential exposure hazards in a given building. There are many variables related to air testing, which can give a false or incomplete picture of asbestos contamination or the potential for asbestos contamination.

Air testing is generally a static measure over a relatively short period of time, typically just a few hours up to a day. Air testing can miss peaks of exposure or may reflect the air quality in a building at a time when there is little or no activity in the building. Other variables such as the use of heating and cooling systems, time of year, open or closed windows and other factors render the use of air testing as the sole method of assessment a poor choice. Other aspects of the decision as to when to remove or what methods may be necessary to control exposures depend upon the location of asbestos-containing products, its ability to become airborne (i.e., has the asbestos-containing product begun to deteriorate, dust, crumble or otherwise fall off the structural beams or ceilings onto other building surfaces) its relationship to public spaces versus enclosed

mechanical or utility spaces, and other factors. Air testing at any one point in time does not allow for accurate projections of future airborne potential, nor does it necessarily provide an accurate measure of past air quality or exposures that have occurred in the building.

8. A corollary issue to the question of asbestos removal is the matter of alternate hazard to those removing it, or the hazards of exposures to individuals from asbestos remaining after an improper removal operation. While it is true that incorrect removal practices can increase hazards to asbestos removal workers or others in the area of asbestos disturbance, it is my professional opinion that asbestos removal, properly and carefully planned and undertaken with due care carries no additional hazard to workers or others who may use a facility over its remaining useful life after the asbestos has been removed. Since federal regulations require the removal of asbestos from a building when it is substantially renovated or demolished, the matter of the safe handling and removal of asbestos will inevitably arise. Thus, the primary question for building owners is not if the safe removal of asbestos-containing materials will be required, but rather when the decision to remove should be made.

9. It is my professional opinion and a well documented scientific fact that asbestos disease is a latent disease, which means that there is period of time (often decades with respect to some malignant diseases) between the exposure to asbestos and the manifestation of illness related to exposure.

10. It is my professional opinion, based upon my own research and work as well as the research and work of many other investigators around the world, that asbestos disease occurs in non-occupational settings including occupants of homes and buildings

contaminated with asbestos fibers released from friable asbestos-containing building products such as those manufactured and sold by W. R. Grace & Co.

Basis for Opinions

My opinions are based upon my education, training and service as a public health physician, researcher, and professor of medicine and public health. I have actively been engaged in the investigation, publication and review of scientific data and articles related to asbestos disease for over thirty-five years. I have conducted or participated in extensive studies on asbestos related disease as set forth in my CV. I have reviewed extensive peer-reviewed scientific and medical literature describing extensive research and investigations into asbestos-related diseases throughout the world. My opinions are not dependent upon a single published report or article, but represent my synthesis of all the literature I have read and all of the work I have done over the last thirty-five years.

Compensation

My rates for work on this case and other related cases is \$350 per hour.

Previous Testimony within the Last Four Years

(Please note: There has been no systematic recording of legal activity by me over the past years, especially not prior to October, 1994. The exact listing for the cases has not been maintained. The list following is the best reconstruction possible covering the four years prior to December, 2006. Some appearances were via videotape.)

<u>Date</u>	<u>Client Name or Location</u>	<u>Law Firm/Attorney</u>
12/04/02	Gillespie, Arena, Russell (T)	Elliott Present
12/09/02	A.Baumann,G.Bates, R.Block (D)	William R. Fahey
12/17/02	Jerome Klepper (D)	Andrew O'Brien
12/18/02	Zehner & Turner (D)	Robert McCoy

01/06/03	G. Koontz (D)	Doug B. King
01/3-6/03	Driver, Bruno, Pierce (T)	Mitchell Cohen
01/8/03	Welding case (D)	Robert G. McCoy
01/15/03	J. Roseman (T)	Elliott Present
01/14/03	Joseph Roseman (D)	Michael Bergin
01/17/03	Pierce & Strasser (D)	William G. Fahey
01/27/03	Willie Lee Robinson (T)	Barbara Lane
01/31/03	James Freezor (D)	Mark R. Kurtz
02/06/03	J.C. Taylor (D)	Reid Acree
02/07/03	8 Asbestos Cases & Whittington Case (D)	Randy Bono
02/11/03	Harold L. Cougenour (D)	Wallace & Graham
02/10-12/03	William Parks (D)	Elliott Present
02/25/03	Herbert Dorf (D)	Michelle Galindo
02/27/03	William Parks	Elliott Present
03/3-4/03	Turner (T)	Robert McCoy
03/13/03	Weyerhouser (D)	Mona Wallace
03/19/03	Roby Wittington (D)	Randy Bono
03/21/03	John Richards (D)	Megan Zeregan
04/07/03	Charles Deese (D)	Reid Acree
04/08/03	P. Thompson & J. Andrees (D)	Lynn Bradshaw
04/28/03	Cornelius Alexander (D)	Jill N. Calvert
04/29/03	Jasper Galm (D)	Elliot Present
05/05/03	Lear & Tison, Stewart (D)	Roger Lane

05/06/03	Hill et (D)	D. Scott Carlile
05/08/03	Roberta Ochs (D)	James Long
05/12/03	Rolf Lindstrom (D)	Robert Ellenstein
05/16/03	6 cases (D)	William R. Fahey
05/27/03	Gavrock & Steel (D)	Newton Anderson
05/29/03	Kenneth Madden (D)	Gary DiMuzio
06/02/03	Salvi & Carlson (D)	Michael B. Leh
06/12/03	M. Gavrock & Wm. Steele (D)	B. J Wade
06/18/03	6 Cases (D)	Ted Gianaris
07/02/03	Hawkins, Canatella, Baker (D)	Matthew Kieley
07/9-10/03	Ward case (D)	Andrew O'Brien
07/11/03	Dixon & Tarranova (D)	Charles Heard
07/14-15/03	Leggett case (T)	Chip Hickey
07/18/03	Fanese case (D)	Alan Reich
07/22/03	Jenkins case (D)	Shawn Parrish
07/30/03	Caffey et al (D)	R. Brandon
08/06/03	Kelley & Richter (D)	Ted Gianaris
08/11-12/03	Asbestos case (T)	Christian Hartley
08/13/03	9 Asbestos Cases (D)	William Fahey
08/14-15/03	Varnadore and Williamson (D)	Roger Lane
09/09/03	Mrs. Benioist (D)	Andrew O'Brien
09/09/03	Norrise case (D)	Joe Satterley
09/11/03	Jones & Osteen (D)	Roger Lane

09/11-12/03	9 Asbestos cases (D)	Gary DiMuzio
09/15/03	Lavi Booth (D)	M. Agelides
09/16/03	2 Asbestos Cases (D)	Christian Hartley
09/19/03	Pennington case (D)	A. V. Conway
09/30/03	William Jackson (T)	William Fahey
10/07/03	Norris case (D)	Robert Paul
10/14/03	Elam case (T)	Robert McCoy
10/15/03	Hargrove case (D)	Wayne Lieg
10/16/03	Norris case (T)	Joe Satterley
10/17/03	Bell et all & Stephens (D)	Gary DiMuzio
11/04/03	Feezor (D)	Joe Satterley
11/10/03	Ott case (D)	Doug King
11/25/03	Szabo & Ingraham (D)	Christian Hartley
12/08/03	Mutiple Asbestos cases (D)	William Fahey
12/16/03	Quareles case (D)	Gary DiMuzio
12/17/03	Emrich case (D)	Don Migliori
12/23/03	Edwin case (D)	Peter G. Bell
12/23/03	Billy Meadows (D)	C. Hartley
01/06/04	Troy Hickox (D)	Roger Lane
01/06/04	Rolf Lindstrom (D)	Donald Krispin
01/07/04	Hill...et al (D)	D. Scott
01/08/04	Multiple Asbestos cases (D)	Ted Gianaris
01/22/04	Easton case (D)	Robert Paul

01/22/04	Smith, Trone, Harris (D)	Parker, Dumler
01/28/04	Clark...et al (D)	DeHay & Elliston
02/03/04	Eaton & Munro (D)	Alan Reich
02/25/04	Lindstrom case (T)	Donald A. Krispin
03/05/04	Thomas Lafferty (D)	B. J. Wade
03/08/04	Munro...case (D)	Douglas B. King
03/08/04	Petruzzi case (D)	Kevin Knight
03/11/04	Eaton & Petruzzi (D)	Robert Paul
03/30/04	Jimmie Mills (D)	Russell Cook
04/01/04	Multiple Asbestos cases (D)	Ted N. Gianaris
04/05/04	J. D. Roberts (D)	Gary DiMuzio
04/14/04	Asbestos Case (T)	Roger Lane
04/15/04	Roy Brem (D)	Michael Bilbrey
04/22/04	Courson case (D)	Russell Cook
04/28/04	Stegemoller case (D)	Doug King
04/29/04	King case (D)	James A. Snowden
04/30/04	Carlisle case (D)	A. Timothy Jones
05/24/04	Egizi (D)	Martin,Bank, Pond, etc.
05/25/04	Bob Brown (D)	Virginia Giokaris
05/28/04	Mutiple Asbestos cases (D)	M. Keiley
06/09/04	L. Franklin (D)	Wade Mitchell
06/18/04	Valentine (D)	Joe Satterley
07/01/04	Multiple Asbestos cases (D)	Ted Gianaris
07/13/04	M. Gussoff (T)	Michael Leh

08/03/04	Multiple asbestos cases (D)	William Fahey
08/16/04	McLean & Little (D)	R. Meriwether
08/16/04	Multiple asbestos cases (D)	William Fahey
08/17/04	Samuel Lewin (D)	D. Krispin
08/19/04	Charles Brewster (D)	Joseph Satterley
08/23/04	Multiple asbestos cases (D)	William Fahey
08/27/04	Multiple asbestos cases (T)	Gary DiMuzio
08/30/04	Multiple asbestos cases (D)	William Fahey
09/30/04	Williams and others (D)	Jackson Kennedy
10/07/04	Landau (D)	Jeffrey L. Pettit
10/07/04	Landau (D)	George Kiser
10/12/04	Mr. Basciano (D) (Benzene PI Workers Comp case)	Mitchell Cohen
10/19/04	Jeffrey Marco (D)	Bartholomew Baumstark
10/19/04	Luke Lindau (D)	Michael Bilbrey
10/26/04	Multiple Asbestos cases (D)	M. Angelides
11/23/04	Charles Logsdon (D)	J. Robert Shelton
11/30/04	Frank Dean (D)	Mike Runyan
12/01/04	Dorothy Hutchins (D)	Mott McDonald
12/20/04	Multiple asbestos cases (D)	D. Scott Carlile
01/07/05	Volluz & Walsh....cases (D)	Bartholomew Baumstark
01/27/05	Karl C. Bowles (D)	Joseph Satterley
02/10/05	Multiple asbestos cases (D)	Michael Bilbrey

03/02/05	Dennis Serbin (Court Appearance)	Marie Terpolilli
03/07/05	Cook & Flax (D)	Mark Dumler
03/11/05	John F. Broyles (D)	Lou Thomas-Black
03/17/05	Luis Vega (D)	J. Katz
03/28/05	Knoth...case (D)	Joe Satterley
04/06/05	Baron....case (D)	R. McCoy
04/12/05	Multiple....cases (D)	Michael Bilbrey
04/18/05	Dexter & Edmonds (D)	R. Shelton
05/09/05	Sarah Groff (D)	William Fahey
05/10/05	For trial appearance (D)	C. Hartley
05/17/05	Jones, et al cases (D)	M. Edmonds
05/17/05	Court Appearance (C)	Joseph Satterley
05/20/05	Agner/Hutchins... et al (T)	M. Wallace
06/01/05	Baren...case (D)	Robert McCoy
06/13/05	Trial appearance.....(T)	C. Hartley
06/21/05	Briggs...case (D)	Lonnie Johnson
06/21/05	Sholar ...case (D)	Knight S. Anderson
06/21/05	Munro....case (D)	Edward Harney
07/01/05	M. Martin (D)	Mike Bergin
07/12/05	Curtis Lightsey (D)	O. Harton
08/03/05	Multiple....cases (D)	Steve Parrott
08/05/05	Massey Miller (D)	B. J. Wade
08/15/05	Curtis Lightsey (D)	Roger Lane

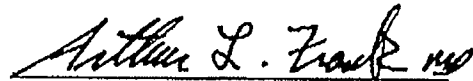
08/18/05	McDowell...case (D)	C. Hartley
08/22/05	Jerry M. Bryant (D)	Russell Cook
08/23/05	Baron ...case (D)	Robert McCoy
08/26/05	Poindexter...case (D)	David Palik
09/09/05	Michael Haussmann (D)	Alfred J. Carlson
09/15/05	Adell Rockmore (D)	D. Scott Carlile
09/26/05	Madison County Case (D)	Charles Hartley
10/06/05	Adell Rockmore (D)	D. Scott Carlile
10/11/05	Harris....case (D)	Roger Lane
11/20/05	Daubert...case (T)	Ted Gianaris
10/21/05	Madison County ...case (D)	Charles Hartley
10/27/05	Egizi...case (D)	A. J. Carlson
10/28/05	C. White.....case (D)	Mike Cascino
10/28/05	James Berlemann...case (D)	R. Gori
11/08/05	Boren.....case (T)	R. McCoy
11/21/05	JoAnn Witt (D)	David Bevon
11/28/05	Flora Franklin (D)	Joseph Satterley
11/28/05	David Lancaster (D)	L. R. King
11/29/05	Littlefield.....case (D)	Douglas King
11/30/05	Alan, Reinstein (D)	Jennifer Hunt
12/02/05	Multiplecases (D)	Roger Lane
12/05/05	Michael Haskell (D)	Robert Bosslet
12/19/05	K. Jonas (D)	Frank Wathen

12/19/05	J. Gallagher (D)	Michael Bilbrey
12/21/05	Ronald Johnson (D)	B. Baumstark
12/22/05	Linda Allen (D)	Scott Carlile
01/10/06	Harold Leedom (D)	Vincent Greene
01/10/06	Harold Leedom (D)	M. Scarpitti
01/17/06	William Shepard (D)	Lou Black
01/19/06	Anthony Betti, Sr. (D)	Andrea McNeil
01/31/06	Joseph Tizcareno (D)	Christopher Wood
02/02/06	Robert Lulich (D)	William Fahey
02/02/06	Multiplecases (D)	Edward Nass
02/13/06	Avis Brown Little (D)	Ed Pauley
02/16/06	Kip Ong (D)	Peter Gilbert
02/20/06	Ryan and Miller (D)	Ted Giannaris
02/21/06	Adams group – Baltimore (D)	Steve Parrott
03/03/06	William Schell (D)	Robert Paul
03/03/06	James Turnbow (D)	Michael Bilbrey
03/06/06	Roberts.....case (D)	Peter Gilbert
03/08/06	Parker.....Case (D)	Stephen Smith, Jr.
03/15/06	Mutiple.....cases (D)	L. P. Rufo
03/15/06	Mutiple.....cases (D)	Ted Giannaris
03/20/06	Adams.....case (D)	Peter T. Nicholl
03/24/06	Gary Randolph (D)	R. S. Jordan
03/27/06	John M. McCormick (D)	Christopher M. Stevens

04/05/06	Asbestos.....cases (D)	T. Crumpler
04/07/06	John McCormick (D)	K. Rank
04/07/06	John Ritter (D)	Robert Paul
04/20/06	James Griffin (D)	Kendra Smith
05/16/06	Michael Haussman	A. Carlson
06/01/06	Charles Clephas (D)	Joe Satterley
06/15/06	Gerald White (D)	C. R. Banford
06/16/06	Clark.....case (D)	K. Ranke
06/21/06	Carol Sutterfield (D)	Russell Cook
06/23/06	James Smukal (D)	R. S. Sigurdson
07/07/06	W. Blanche, J. Rowan (D)	M. Cancelliere
0730/06	Stephen Trombatore (D)	S. Flanagan
08/15/06	James Parsons (D)	R. Krause
08/16/06	William Lacey (D)	B. Baumstark
08/16/06	Multiplecases (D)	M. Kiely
08/21/06	Harold Garmon (D)	Ed Pauley
08/22/06	Multiple....cases (D)	P. Browder
08/22/06	Richard Eisinger (D)	R.T. Connor
08/28/06	Andrew Baker (D)	M. Reid Acree
98/31/06	Leon Parker (D)	Ken Sales
09/01/06	Multiple....cases (D)	Ted Gianaris
09/01/06	T. Sparks (D)	Stuart McIntosh
09/06/06	Joyce Applequist (D)	C. Hartley

09/07/06	C. Parisi (D)	Matt Kiely
09/11/06	Jasinkas & Weir (D)	C. Hartley
09/21/06	Multiple.....cases (D)	P. Browder
10/29/06	Carmen Stigliano (D)	Loreto P. Rufo
10/03/06	Video Depo for Trial	Roger Lane
10/04/06	Allen Schriener (T)	Ted Gianaris
10/13/06	Multiple.....cases (D)	Ted Gianaris
10/16/06	Michael Haskell (T)	R. Bosslet

* * *


Arthur L. Frank, MD, PhD